

# PEST TECHNOLOGY

## Pest Control and Pesticides

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## "PEST TECHNOLOGY"

extends Christmas and New Year Greetings  
to all its readers, wherever they may be . . .

CHRISTMAS, apart from its more serious significance, is universally regarded as a period of relaxation and enjoyment, feast and festivity. This would be amazing if one could divorce oneself from the proceedings and consider the situation from a cold and logical point of view.

For example take those last minute excursions to buy the forgotten present, which usually means making mad perilous dashes between cars, buses and lorries, pushing and squeezing through hoards of people on similar errands, being almost run through by some sharp steel pointed umbrella wielded by a careless female who cannot make her mind up whether to cross the street, look in shop windows, stop, go forward or generally get in everyone's way. Eventually you may fight your way to the shop counter more or less intact, frequently finding that the object of your quest has already been sold. There and then amidst a pushing, shoving, jostling throng you have to decide on an alternative present—a difficult task at the best of times. Having made your purchase or given it up as a bad job you somehow have to return home through a seething mass of humanity and metal, otherwise known as traffic. Yet we enjoy it, that's Christmas.

For the puzzled reader who may wonder what on earth this has to do with Pest Technology, Pest Control or Pesticides the answer is—nothing at all, but then, it's the time for relaxation and enjoyment, feast and festivity.

\* \* \*

The festive season has attendant problems for publishers of journals, particularly scientific journals. Two issues have to be prepared in a little over the time that it normally takes to prepare one. Then again, many of the people who provide us with information are very busy with their own personal and business arrangements. For example most of the spraying machine manufacturers have their hands full with the Smithfield Show. Many are furiously engaged in the background work of preparing for next year's activities, sometimes holding up our lines of communication and tending to make life a little more hectic.

Whilst on the subject of communications we would like to say that however many letters we receive, we are always glad to receive more. Readers should not hesitate to write to us if they feel they would like to submit an article, send us information or to express their opinions for our postbag helps us to keep in touch with present and future trends.

Changing the subject to future trends, we have recently heard a number of opinions expressed on changes in the approach to grassland management, to the use of weedkillers in general, to the formulation of pesticides, and to spraying techniques. However, this is hardly an appropriate month to discuss them.



# CONTROL OF FABRIC PESTS WITH ANTIMETABOLITES

LIFELONG immunity of fabrics against textile-destroying insects which cause millions of pounds worth of damage annually to carpets, upholstery and clothes may be achieved through the use of a compound developed at the University of California, Los Angeles, U.S.A. Colourless, odourless and harmless to humans, the material can be impregnated during the dye vat process, and is said to make fabrics permanently indigestible to carpet beetles, clothes moths and other pests. It can also be applied in an aqueous solution to existing fabrics in the home or at the dry-cleaners.

Research into the use of these antimetabolites has been carried out by Roy J. Pence at the University's Department of Entomology and he has also studied the reasons why synthetic fibres are at times acceptable as food by the fabric pests and at other times ignored.

In the case of woollen fibres it is known that when these are thoroughly cleaned they do not contain sufficient nutrients to enable fabric pests to complete their normal life history and that factors of the vitamin B complex are necessary for successful development of the clothes moth. Little or no growth takes place in the absence of niacin (nicotinic acid) or pantothenic acid and studies indicate that there may be nutritional factors of equal importance occurring in or on natural fibres which may belong to the sterol group, as affecting dermestids, or carpet beetles. The latter are known to pass from 5 to 16 instars before reaching laval maturity, some requiring a period of as much as 630 days to reach pupation, this variation being directly related to nutritional factors.

To make supposedly "clean" fabrics palatable to fabric pests, it is considered that there must be traces of extraneous matter present. Contamination may directly result from spilled food and drink, skin secretions and other types of soiling or indirectly from the synthesis of micro-organisms that gives the small but highly important quantities of nutritional vitamins. Considerable quantities of pantothenic acid alone become available through contamination, whether direct or indirect. In addition to the yield of *Escherichia coli*, body oils "trap" many species of air-borne micro-organisms which are also capable of synthesising pantothenic acid.

This knowledge of the nutritional requirements of fabric pests and the manner in which nutrition is obtained has provided the foundation for further investigations into the means of depriving the pests of their dietary needs and, in this connection, antimetabolites are employed to considerable advantage as a means of pest control.

Tests have shown that antimetabolites, if properly

applied, are instrumental in causing some "break" in the metabolic chain and in causing clothes moth larvae to perish by starvation. After test fabrics have been treated with growth factor analogs and clothes moth eggs are introduced, the first instar larvae never reach the first molt, and, though they may live for a period of ten days, the damage to fibre resulting from their constant "grazing" cannot be detected except by microscopic examination. This is because of their continuing migration over treated material as they search for vital nutritional elements. Normally, the tendency with untreated material is to find an adequate feeding area and then remain until the fabric is eaten away. The intake of treated fibre also decreases and so continues until death follows. There is also a lack of fibre "severing" for use as webbing material for the construction of shelter tubes.

Experiments are being conducted to evaluate what antimetabolite or combination of antimetabolites would be best suited for specific purposes.

Studies are also being made with dermestids which can exist longer on a starvation diet. The degree of mortality of first-instar furniture carpet beetles when exposed to a diet of niacin-deficient fibres is, however, significant.

In all cases, there is a lack of damage to treated fabrics, even when supplemented with whole yeast in which is found the very substance so essential to fabric pest development.

How to employ these antimetabolites for the practical control of fabric pests has also been under investigation, the aim being to permanently impregnate these compounds into new textiles in the mills to provide life-long insect proofing. Such a technique, using an insecticide, has, in fact, been employed by investigators working for Shell Chemical Company, who have permanently impregnated small amounts of one of their formulations into fabrics during the dye vat process. In spite of repeated dry-cleanings these chemicals remained effective.

Under the microscope, a cross-section of a single strand of wool is shown to be composed of three parts. The keratinous cuticle is made up of close-fitting scales, while beneath this scaled covering lies a softer, inner layer called a cortex. The core-like centre is called the medulla. Each of these structures contains its own individual chemistry. During the dye vat treatments the boiling liquids cause each outer scaled surface to soften, allowing a penetration of the solutions. Through these temporary openings, antimetabolites are permitted to enter the inner structures of each fibre. The "fixing" procedure is always followed by treatment with cooler





*The furniture carpet beetle and its damage to fabrics.*

liquids and, as the temperature is lowered, the scaled cuticle closes, locking in the dyes and inhibitors. Taking the precaution never to clean woollens in hot water ensures that the chemicals will be "locked in" to stay for the life of the fabric.

Preliminary experiments have shown that some inhibitors are not appreciably removed by three consecutive dry-cleanings using 99.9% pure carbon tetrachloride and chemically pure benzene. These are of a more highly refined quality than the less expensive solvents used by commercial dry-cleaning establishments. Many trials have yet to be conducted to determine how long they will last under the severest of cleaning processes.

Experiments are now under way to determine a practical means of treating existing fabrics in the field and it would seem that antimetabolites can be considered safe as far as accidental human consumption is concerned.

The inclusion of some of the newer surface-active agents with antimetabolites, particularly the quaternary ammonium salts which are cationic surfactants, indicates that these will contribute substantially toward a "plating on" of chemicals and, at the same time, serve as excellent softening agents.

Since some products, such as the new quaternary ammonium salts, carry a positive electrical charge, while

textiles possess a negative charge, the positive-charged molecules are attracted to most fibres where they are tenaciously retained. The molecules tend to orient themselves toward the fibres, leaving two fatty tails exposed to give surface softness and lubricity. They thus tend to preserve fabric texture. By including a cationic activator with non-poisonous antimetabolites, a simple aqueous solution is provided which may be applied to all woollens or woollen combinations without known danger of odour, stain or poisonous after-effects, though repeated applications may be required to maintain protection.

Since insects have the ability to become resistant to insecticides and repellants, which for a time are successful, starvation through the action of antimetabolites may be the means of meeting these immunity and resistance problems.

So far, uncertainty exists as to exactly what nutritional elements may be contained in synthetic fibres that might contribute, in part, toward the normal growth requirements of fabric pests. Keratin-feeding insects can switch their feeding to many synthetic substances, but a catalyst or additive generally attracts them to such a new diet and the contamination factors hold good as in the case of woollens.



# SOME

# HARMFUL

# MAMMALS

## Squirrels

**B** RITISH problems associated with squirrels apply only to two tree climbing species, the native red squirrel (*Sciurus vulgaris leucourus*) and the grey squirrel (*S. carolinensis*) introduced from America.

Nowadays no action is taken against the former as the present population is too small to constitute a serious threat. Previous to the 1920's the red squirrel caused considerable damage to various softwood trees such as Scots pine and Norway spruce. In addition wherever they were numerous the red squirrels frequently ate the eggs of poultry and game and were often known to wreak havoc in vegetable gardens. Crops of fruit and nuts could not be considered immune to the raids of these creatures. However, between 1862 and 1924 a widespread epidemic disease, thought to be coccidiosis, greatly reduced the numbers of the red squirrel. The concurrent rapid increase of the introduced grey squirrel, both in numbers and range, appears to have depressed the recovery of the red squirrel population.

Originally an animal of hardwood forests the grey squirrel has proved to be very adaptable and, finding the absence of predators and the equable British climate to its advantage, has successfully occupied a variety of habitats. Where oak trees are abundant, mixed woodlands have provided a particularly suitable habitat for the grey squirrel.

The most serious type of damage is that inflicted upon hardwood trees between 10-40 years old (Pole stage) the squirrels peeling the bark from the main stems. In this manner many trees can be killed or distorted within a few weeks. Attacks are made from the end of April until late July and as the damage is more severe in dry weather it has been suggested that it is the sap which attracts the squirrels.

The most frequent attacks are on sycamore which is usually damaged at the crown whilst beech, which is quite often attacked, is more likely to be girdled round the butt. Many other hardwood trees and some conifers suffer in a similar manner.

Stands of elite trees can be stripped of seed and damage caused to cereal crops growing near woodland. As is

the case with the red squirrel, fruit and nuts create a natural target and the eggs of poultry and game are not safe when the grey squirrel is around.

Gardens containing fruit, bulbs, flowers and vegetables can be devastated by the raids of a few squirrels although the blame is sometimes placed upon the rabbit.

In England the usual methods of control are the destruction of nests (dreys), shooting, tunnel trapping and cage trapping, poisoning is illegal. The nests are usually destroyed in autumn and winter by the use of sectional metal poles, the escaping squirrels are shot. Some people prefer the simple expedient of "Blasting the nest apart with both barrels of a shot-gun," this kills the squirrels inside and obviates the necessity of firing at a fast moving target. Although this rather crude method cannot always be carried out, due to the height of the dreys and the corresponding range of the shotgun, it can in some cases reduce the numbers escaping as well as cutting down the risk of merely wounding the squirrel.

Tunnel trapping, which can be very successful, requires the careful positioning of traps in places where the squirrels are likely to be travelling on the ground. As in the case of the proverbial cat it is curiosity that kills, for, although from January to July, baiting with whole maize may lead to a rapid succession of catches, especially with pre-baiting, unbaited tunnel traps often catch squirrels in autumn and winter.

Baited cage traps are at present the best weapons for the control of squirrels as they can be depended upon to give good results when the squirrels are causing the most damage. However, the results may not be so good between August and November because of the abundant supply of acorn and hazel or other nuts.

Repellants have been tried but as yet there is no chemical substance which will afford economic protection against damage by squirrels during the months of April to July.

Biological control, by the introduction of pine-martens, has been envisaged, but in view of the associated risks it has not been carried out.

Organisation of control measures taken during the winter months is essential and a simultaneous attack



must be made on all the squirrels in a woodland area, for it has been found that the grey squirrel travels widely during certain months of the year—particularly May and June. Unless the degree of organisation is high, summer control will be necessary as the squirrels are not particular as to whose property they habit.

### Rabbits

In the past there has been a tendency to under-rate the destructiveness of rabbits. To a certain extent this has been due, perhaps, to the favourable publicity they have received in children's books. However, this facet of the problem is outside the scope of this article.

The fact that they are pests cannot now be doubted, for rabbit grazing of pastures will cause a marked reduction in the yield of grasses useful for the feeding of livestock. Moreover, not only does the grazing of rabbits reduce the amount of nutritional grasses but their disturbance of the soil leads to a cumulative increase in weed population. This fact has been illustrated by an experiment (full details unpublished) at Wye College which showed that in the first year of the sheep liveweight increase on the rabbit grazed plots was 20% less than on the rabbit free plots. In the second year the difference was 64%.

Regarding arable crops, the damage to which is more easily assessed, it has been calculated that in a winter corn field 3-5 rabbits, each eating 1 lb. of green stuff a day, could graze an acre of corn 2-3 inches high to within 1 inch of the ground in four weeks. Considering the fact that the density of rabbits in many areas, where winter corn is one of the main crops, has been as high as 10-15 rabbits available for feeding on the wheat, it is not surprising that large fields of young wheat may be destroyed during the course of a few weeks.

As market gardeners and farmers know only too well, rabbits are liable to cause considerable damage to other arable crops and the barking of young trees has necessitated the erection of miles of rabbit proof fencing by forestry workers.

An additional point to be remembered when considering the damage caused by rabbits is the fact that the reduction in plant population leads to a higher concentration of insect pests per plant. The problems that this can bring about need no illustration.

Rabbit control is normally accomplished by gassing, shooting and trapping. The fact that humane traps must be used and poisoning is illegal does not help to solve the problem. Repellants have been tried, especially on trees, and some success attained. Unfortunately, as there is no decrease in the rabbit population, they are quite likely to turn their attention to untreated crops and cause just as much damage.

The development of Myxomatosis after the first outbreak in October, 1953 lead some people to believe

that the rabbit population would be exterminated, indeed for a short time after the initial outbreak, efforts were made to prevent the spread of the disease. However, within a year it was realised that the disease was continuing to radiate naturally at a rate of  $3\frac{1}{2}$  miles per month and the Myxomatosis Advisory Committee recommended that the situation should be turned to advantage by eliminating the surviving rabbits before they built up in numbers.

Towards the end of 1955 the great majority of the rabbit population had been killed but at the present evidence shows that the population is again on the increase. In Britain it is probable that the lower mortality almost entirely due to the development of attenuated strains of the Myxomatosis virus which, because they do not kill the rabbit, will have a selective advantage in transmissibility. The widening spread of the low virulence virus leads to an increase in the number of rabbits with an acquired immunity to the virulent strain. Although in Britain there is no evidence to suppose that the progeny of the immune rabbits have developed a genetic resistance to the virulent strain, it remains a possibility.

Campaigns against the rabbit must be continued and more research carried out to find efficient methods of control. One small point to be remembered is that in areas with a high fox density any successful campaign against the rabbit will necessitate a complimentary limitation of the fox population. The population of other rabbit predators, such as weasels, will also have to be watched in areas where there is a possible danger to poultry and game.

### Voles

In Britain problems associated with voles are more or less confined to the activities of the short-tailed vole (*Microstris agrestis*). The vole population is subject to irregular fluctuations and under favourable conditions the numbers can rise to plague proportions.

In normal circumstances the vole is essentially a herbivorous animal, preferring the dense low cover of rank grasses and herbacious species, a habitat commonly associated with derelict agricultural areas, wasteland and young forest plantations where grazing animals are excluded. However, when voles are present in high numbers, newly planted trees are often utilised as a source of food, particularly when the growth of grass is low due to the season or drought.

The most serious damage is usually confined to plantations less than five years old and consists of the girdling of the main stem and lateral roots. In severe cases the stem may be gnawed through completely, or the bark stripped off the greater part of the stem.

With severe infestations illustrated by the numbers of voles occurring in 1956-57, 30% or more of an infested



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plantation may have to be re-planted. Naturally the problem is not confined to forest trees for orchard trees may suffer in a like manner.

Another problem created by a high vole population is the damage caused to plastic covered telephone cables, where these cables have been laid by a mole-plough machine. In 1957 as much as 12% of the faults detected in such cables were due to the activities of burrowing animals, mainly voles. In certain western counties 80% of such faults were caused by burrowing animals gnawing through the cables. Repellants are obviously the best means of overcoming this particular problem and the Post Office are considering their use.

Until recently control has been more or less restricted to trapping, which is relatively innocuous when the population reaches plague proportions. The widespread damage occurring in 1956-57 stimulated interest in methods of control and protection and the Forestry Commission Research Branch have laid down a number of trials including several to assess the value of chemical repellants applied to the aerial parts of young trees before planting. Some compounds have shown promise, notably tri-benzine aniline, bone oil and propriety compounds "Arbinol" and "Wiltex" all of which may have practical possibilities. Definite recommendations cannot be made at present as the trials are not yet completed.

Baited poisons such as warfarin, zinc phosphide, and red squill have been tried but although considerable numbers of voles have been killed results have been inconsistent.

In the search for new methods of control the Forestry Commission and the Ministry of Agriculture showed interest in the encouraging results obtained on the continent from the use of the "insecticides" Toxaphene and Endrin.

Trials with these insecticides were carried out separately by the Forestry Commission Research Branch and the Infestation Control Division of the Ministry of Agriculture and following continental experience and the insecticides were applied at rates of 1.78 to 2.68 lb. of active Toxaphene per acre and 0.27 to 0.45 lbs., of active Endrin per acre. This is approximately 5 times the rate applied for insect control. The trials were also carried out in late autumn as workers on the continent have found this the best period for treatment because breeding has ended and the entire population can be controlled before the winter attacks on planted trees.

The results of the trials carried out by both of the preceding organisations, showed that treatments with these insecticides, particularly Endrin, could be of great practical value under circumstances where severe vole injury is likely to occur.

Before these insecticides can be used commercially for the control of voles several problems will have to be solved. At the high application rates employed there is a grave risk of injury to any wild or domestic animals and birds feeding on the site. Toxaphene and Endrin are particularly toxic to fish and amphibians and therefore care must be exercised in order to prevent these chemicals straying into rivers and streams. The effects of these compounds on herbivores feeding on the treated herbage or carnivores feeding on the dead voles, is very undecided for although these animals run the risk of being poisoned, there has been no positive proof of poisoning to any animals or birds, other than voles, which have been found dead in or near to the treated sites.

The reason for the "compounds" particular toxicity to voles is believed to be due to the voles' continuous feeding habit by which they consume a large quantity of poisoned herbage, compared to their body weight, in a short time.

Research into the behaviour of voles is also required, for although in the Forestry Commission's trials the number of voles on land surrounding the treated areas decreased, it was found in Denmark, that the only areas requiring treatment in the following years, were the treated areas. This is due to the voles' tendency to quickly invade any unpopulated territory.

The effect of the highly residual Endrin on the microflora and microfauna of the soil must also be investigated.



# AFRICAN PYRETHRUM

## TRADE NOTES

*Review of Year July, 1958 — June, 1959*

IN the October issue of *Pyrethrum Post*, Mr. N. H. Hardy, O.B.E., Administrator, African Pyrethrum Technical Information Centre, gave some interesting details regarding the Kenya Pyrethrum production and sales year which ended on 30th June, 1959 and which proved to be one of the most difficult yet experienced from the production aspect. The reasons for the difficulty have been investigated and are given as follows.

The abnormally heavy rainfall which has characterised the growing seasons since 1954, ultimately had a detrimental effect on yields during the period 1st July, 1958 to 30th June, 1959. The main factors contributing to a decrease in production during this period are believed to be poor nitrification (resulting from the lack of a dry spell), severe infestations of thrips (possibly encouraged by a general rise in mean temperatures) and unusually wet and overcast conditions in the early part of the season. A combination of circumstances resulted in a reduction in flower yields between July and December, 1958, in the main producing areas.

A return to what used to be considered a normal comparatively dry spell between January and March, 1959 was, in the main, welcomed by growers in the anticipation that the present season would be an improvement. Unfortunately, as so frequently happens under East African conditions, the reverse proved to be the case and the rains expected in April, 1959, either failed to materialise or were light and erratic. The unfortunate coincidence of these conditions with a drive for increased production has had the result that newly planted pyrethrum has experienced severe drought and production has thereby suffered due to poor yields.

The supply situation has been further aggravated by the rapid increase in demand which resulted in the complete sale of the July, 1958/June, 1959 crop, in addition to the unsold stocks which were carried over on 30th June, 1958. Briefly—although supplies will be restricted for some months to come—it is believed that the additional acreage planted last year, which has not yet come into full production, in conjunction with the percentage of this season's new acreage which will

survive, will enable the Kenya Board to fulfil its commitments, probably with some delay and with little to spare.

Other activities of the African Pyrethrum trade which were discussed in the same article are as follows.

The final production available to the Pyrethrum Board of Kenya for the period 1st July, 1958 to 30th June, 1959 was 4,048 tons; against 4,700 tons for the preceding period. In spite of this lower production, actual sales in 1958/59 exceeded the comparative figure for 1957/58 by approximately 15%; the increased demand being met from unsold stocks carried over at the end of June, 1958. However, it has proved necessary to advance the prices of flowers and powder by approximately 9% to offset enhanced costs of production and handling.

### **Extract Factory**

The Pyrethrum Board of Kenya has every reason to be satisfied with the initial period of operation of its new Extract Factory at Nakuru. The primary objective of producing an extract acceptable to buyers has been achieved and the economies effected by the processing of the crop in the Board's own factory, as opposed to processing under contract, will assist towards off-setting the growers' increased costs of production which have shown a marked upward trend over the last four years—during which selling prices have remained at the same level. Plans for the extension of the factory to deal with increasing production are well under way and the additional equipment required to produce PALE (decolourised) extract, for which there is a demand in certain markets, should be in production by December. The bulk of the extract produced by the factory will continue to be marketed as the same high quality OLEORESIN 25% w/w extract for which the demand is, at the present, more widespread.

### **Belgian Congo**

The supply position in the Belgian Congo is similar to that in Kenya, in that the total crop for the period 1st July, 1958 to the 30th June, 1959, together with stocks held at the 30th June, 1958, has been sold. The activities



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of SOCOPA are progressing favourably on a completely independent basis from those of the Pyrethrum Board of Kenya; since 1st July, 1959, the operations of the Congo and Kenya Boards have been entirely separated except for liaison on technical matters. Buyers are requested to approach SOCOPA, P.O. Box 10, Goma, Lake Kivu (or their distributors), in respect of all matters concerning Belgian Congo sales.

SOCOPA have recently appointed Biddle Sawyer Corporation, 20 Vesey Street, New York, as their Agents in the U.S.A.

## APTIC

The African Pyrethrum Technical Information Centre (APTIC) which commenced operations early in 1958, has more than justified its creation; as the results for the year ending 30th June, 1959 indicate. During this period, Technical Service Representatives have made 180 visits to insecticide manufacturers and prospective users in Europe and Africa; while the Nakuru Centre alone has dealt with 629 enquiries arising from these visits and from firms whose interest has been aroused by APTIC's publicity activities. The operations of the London Centre have likewise developed on the same scale. The programme for the 1959/1960 season is designed to carry the operations of APTIC into those parts of the World which have not yet been visited, and where development potential is apparent.

The issue during the year of the Formulators' Manual, reviewed in the April issue of "Pyrethrum Post," has proved highly successful, and is in great demand.

The value of personal contact has been demonstrated by the number of firms who have, through discussions with Technical Service Representatives, decided to include pyrethrum in their formulations for the first time or to increase their range of pyrethrum-based insecticides. In this connection, enquiries have resulted in investigations being carried out in the Nakuru Laboratories on the application of pyrethrum for specific purposes, following APTIC's policy of providing the fullest possible information to assist users of pyrethrum—the merits of which are becoming increasingly recognised in new fields.

## ERRATUM

Pest Technology volume 2, number 2, (November, 1959) page 28, column 2, line 3, substitute non-ionics for anionics. Corresponding phrase then reads:-

"For such purposes, field experience has shewn that non-ionics are far preferable . . . ."



# SPRAYING MACHINES AND EQUIPMENT

The Kestrel Engineering Co. Ltd. are exhibiting their **Kestrel Knapsack Sprayer** in public for the first time. This machine appears to be particularly suitable for horticulturalists, smallholders, park superintendents and the like.

The Kestrel is reputed to be the only sprayer with an unbreakable polythene container which is resistant to all chemicals likely to be used. Weighing under 9 lbs., complete, it is very light to carry. The container is instantly detachable, so that a battery of them can be used with one machine, ensuring continuity and speedier spraying. If required separate containers could be used for fertilisers, weedkillers, insecticides, etc., to obviate contamination.

There is a diaphragm type pump with a working pressure up to 65 p.s.i. The large capacity air chamber enables a high constant pressure to be maintained without any need for continuous pumping.

The machine is supplied with a standard 24 inch polythene lined lance with simple lever operation giving instantaneous on-off control. There is also a complete range of lances and jets to cover all spraying requirements including telescopic lances up to 15 ft. long which can be used to spray high foliage over ditches etc.

Also making their first public appearance are the Kestrel Dusting machines which have been receiving praise from many sources both home and overseas.

## Allman's to use American Hypro Rollervane Pump in 1960 range

In their 1960 range of spraying equipment, E. Allman & Co., Birdham, state they are using Rollervane pumps only. They have been appointed concessionaires for the United Kingdom for the American Hypro Rollervane pumps and these units will be used on their Speedispray and Model 100 Sprayers.

Their own Rollervane pump, known as the R.V.9, will be continued on the "Plantector" 60 and range of Implement Washers.

All new spraying machines will be supplied with Power Take Off Guards to meet Ministry specifications and prices have been adjusted slightly to accommodate this feature.

The restyled Speedispray 40 will now incorporate the new Allman Hypro C.6600 pump, again giving application rates up to 40 g.p.a. at 4 m.p.h.

A new addition to their range of machinery will be the Allman "Sussex" Fertilizer Spreader, this being of the spinner type mounted on the three point linkage, will be sold at £39 10s. 0d. complete with Power Take Off Guard. This machine was previously manufactured and marketed by Lloyd-Gentle.

All of the above equipment and, of course, many other items such as their complete range of Row Crop Wheels and Implement Washers will be exhibited at the forthcoming Smithfield Show.

## New Soil Injector

Cooper, Pegler & Co. Ltd., are exhibiting their full range of Spraying and Dusting machines for all agricultural and horticultural purposes. There is also an interesting addition to the range in the form of the **Mapic D.5** soil injector.

The Mapic D.5 has been developed for disinfecting the soil by the injection of insecticides and fungicides, under high pressure. Accurately measured doses, from 1 cc. to 5 cc., are diffused into the soil by the powerful pump at pressures up to 425 lbs. p.s.i.

With a  $\frac{1}{2}$  gallon non-corrosive Plastic Tank, the whole machine is of robust construction—yet weighs only 9 lbs. The Outlet Valve is protected by an easily accessible Filter, and the Injector Point is of hardened steel.

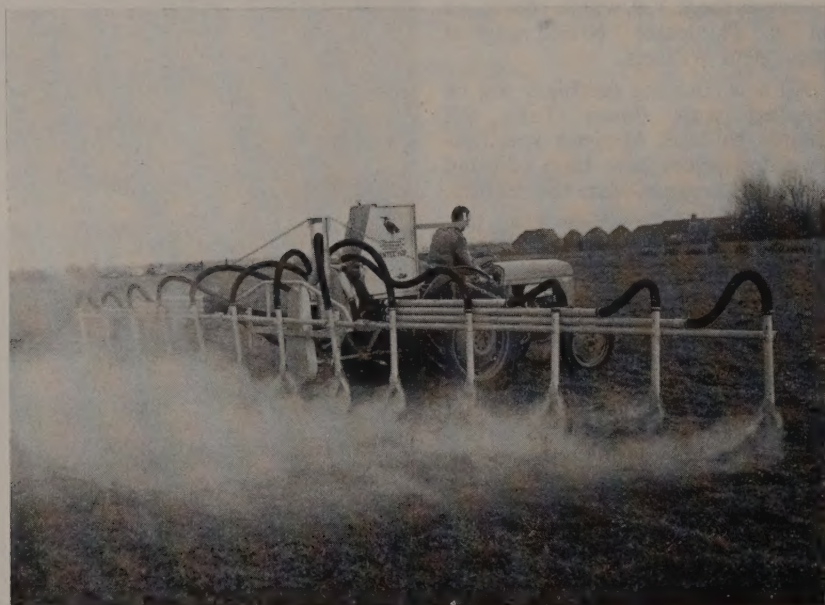


*The Mapic D.5. Soil Injector*



# SPRAYING MACHINES AND EQUIPMENT

(Note: Information received prior to Smithfield Show. Details of Smithfield Show will be given in the January issue.)



Above: Dorman Plantector 13 row Mounted Duster in action.

Below: Dorman 60 Gallon Mounted Hop Sprayer with Sewell 4 Piston Radial Pump and 7 Blowers.



## Dorman Sprayer Demonstration — Machines for 1960

At the annual demonstration of spraying equipment held by The Dorman Sprayer Co. Ltd., at Teversham on the 17th and 18th November, a considerable variety of spray equipment was shown to meet the needs of farmers of all sizes to suit a wide range of crops. This demonstration is regarded as a preview of the machines to be shown at Smithfield.

Since their last demonstration, the range of machines has been considerably increased, and by close co-operation with other specialists in this field in Europe and Australia, a marked advance is noticeable in many directions.

The range of tractor mounted sprayers has been extended by introducing a new series known as the **General**. These sprayers are similar to the Utility range but are fitted with a larger capacity pump permitting application rates of 40 g.p.a. at 4 m.p.h. This machine is fitted with a rollervane pump constructed to the design of the Hypro Engineering Co. Ltd., of the U.S.A.

The Standard Mounted Sprayer has been fitted with a hydro ejector agitator which has been so successful on the Super range last year and they have also been mounted on a new chassis. These sprayers and the Super range are both fitted with the Dorman Hypro rollervane pump with hard chromium lined body giving excellent wear resistance.

The new Orchard Sprayer produced in conjunction with Lindinger of Copenhagen is a high efficiency low and medium volume mist blower shown as a mounted sprayer but also available as a trailer with either engine or P.T.O. drive.

Two High Pressure Mounted Sprayers with mechanically agitated tanks of 60 gallons capacity and with high pressure piston pumps manufactured under licence from the Australian Sewell Company, were shown: One with a 2-cylinder pump with a capacity of 5 g.p.m. and one with a 4-cylinder pump and a capacity of 10 g.p.m.

Another entirely new machine is the Dorman Hop Sprayer. This is a low priced air assisted low and medium volume sprayer suitable for both hop and fruit spraying arranged for easy mounting on the tractor with a 60 gallon tank. The sprayer has been kept to a minimum height and



is suitable for mounting on the narrow width Ferguson tractors.

The Dorman Plantector Potato Duster was also demonstrated. This sprayer, developed by Plant Protection Ltd., gives remarkably uniform coverage over 13 rows and is suitable for both micronised and normal copper dusts. The duster can also be used for insecticides to any normal formulation.

The range of Knapsack Equipment has been extended by the introduction of a  $3\frac{1}{4}$  gallon Diaphragm Pump Type Knapsack Sprayer and a  $3\frac{1}{4}$  gallon Piston Pump Type. The recently introduced motorised Osprey Ace Sprayer and Duster was also shown. This machine has been very successful both at home and in a number of overseas markets since its introduction less than a year ago.



Above: Dorman 60 gallon Mounted high/low volume sprayer with modified 1960 chassis.

Below: Dorman-Lindinger 60 gallon Mounted high/low volume Orchard Sprayer.



## NEWS

### Helman's Announce Name Change

Due to prior claim by a British Manufacturer H. E. Helman & Co. Ltd. (Insecticides) announce that the name of the anti-mastitis product that they are marketing will be changed from Mamex to Bovex.

### Schemes for the Inspection and Certification of Growing Crops of Potatoes (England and Wales), 1960

Growers of seed potatoes in England and Wales are reminded that crops will not be eligible for entry into the "S.S." and "A" certification schemes unless they are grown on land which has been soil sampled by an officer of the Ministry and found to be free from potato root eelworm.

Growers who intend to enter crops and who have not yet completed an application form for soil examination should apply at once for form HI.8 to the Ministry of Agriculture, Fisheries and Food, Plant Health Branch, Whitehall Place, London, S.W.1.

Applications for soil sampling will not be accepted after 15th March, 1960.

### Scheme for the Inspection and Certification of Black Currant Bushes

A register of stocks of black currant bushes, certified by the Ministry of Agriculture, Fisheries and Food in 1959 in respect of health and purity, is now available free on application to the Ministry of Agriculture, Fisheries and Food, Plant Health Branch, Whitehall Place, London, S.W.1.

### Certification of Fruit Tree Rootstocks, 1959—Register of Growers

The Annual Register of growers of fruit tree rootstocks certified by the Ministry of Agriculture, Fisheries and Food in 1959 in respect of health and purity is now available free upon application to the Ministry of Agriculture, Fisheries and Food, Plant Health Branch, Whitehall Place, West Block, London, S.W.1.



## Obituary

It is with deep regret that we inform our readers of the death of Mr. Claude Sisley who passed away on Wednesday, 18th November.

Mr. Sisley was one of the first to join the Cuprinol organisation when it was instituted in this country in the early 1930's. He had been in semi-retirement for the last few years but he had continued to act as a Technical Consultant for this Company.

Mr. Sisley was held in very great respect and affection by all those with whom he came in contact. He was considered an authority on wood preservation and continued his association with technical organisations. He was an honorary life member of the British Wood Preserving Association, of which he was for many years a member of the Governing Board, and other specialist Committees. He was Honorary Treasurer and a Founder Member of the Wood Forum, and a Fellow of the Royal Entomological Society.

Mr. Sisley was very well known throughout the country as a lecturer on timber preservation, and he was the author of a number of papers, etc. on this subject.

## New Cyanamid International Director General

Dr. R. C. Swain, vice-president and a director of American Cyanamid Company, has been appointed director general of Cyanamid International. This was announced in New York on 20th November by Dr. W. G. Malcolm, president. Mr. S. C. Moody, former Cyanamid International Director General, will continue as Cyanamid's staff vice-president for international relations. Dr. R. O. Roblin, former general manager Commercial Development Division, has been appointed a vice-president and will assume Dr. Swain's former staff responsibilities in the supervision of Cyanamid research. He will also direct commercial development, engineering and construction.

## U.K. High Commissioner in New Delhi

Dr. H. R. Ambler, O. B. E. F.R.I.C., has been appointed to the newly created post of Scientific Adviser to the U.K. High Commissioner in New Delhi. In addition to advising the High Commissioner on scientific matters, he will be responsible for furthering the exchange of information between British and Indian scientists.

Dr. Ambler, who is 58, will hold the rank of Senior Principal Scientific Officer in the Department of Scientific and Industrial Research.

## N.A.A.S. Appointment of County Advisory Officer for Cumberland

Mr. K. M. Pearman, B.Sc., N.D.A., at present Deputy County Advisory Officer in Devonshire, has been appointed County Advisory Officer for Cumberland in succession to Mr. T. Williamson, N.D.A., N.D.D., who was transferred as County Advisory Officer for Oxford on 1st September, 1959.

Mr. Pearman, who has been a member of the National Agricultural Advisory Service since its inception on 1st October, 1946, served in Gloucestershire prior to his appointment to Devon in January, 1949. From 1939-1946 he was a District Officer in the Gloucester War Agricultural Executive Committee.

## Associated Fumigators Set up New Research and Development Department

Messrs. Associated Fumigators Ltd., manufacturers of the well-known series of fluoroacetamide pesticides including "Tritox" and "Megatox" announce the formation of a Research and Development Department, to be directed by their technical staff in co-operation with their Consultants, M. A. Phillips and Associates, Ltd.

The new department will deal, amongst other things, with fundamental research on residue analysis in plants, wetting problems for agricultural sprays etc. and with commercial developments based on new compounds derived from fluoroacetamide and fluoroacetanilides and also on mercurial and non-mercurial fungicides.

In the new laboratories now being erected, it is also hoped to commence work on nematocides, with special reference to systemic nematocides.

## British Wood Preserving Association

The 1960 Convention organised by the above Association will be held at Cambridge from Tuesday, 12th July to Friday, 15th July, 1960.

## Latest British Ratin Group Merger

The British Ratin Company Ltd. has acquired the whole of the share capital of Scientex Ltd., Scientex (Southern) Ltd., Scientex (Tyneside) Ltd., Scientex (Scotland) Ltd., and Agricultural and Industrial Coatings Ltd.

The main business of the Scientex Companies is the control of rodent and insect infestations, particularly in ships, but they also sell insecticides, disinfectants and allied products to ship owners. The servicing work on land is being transferred to the District Offices of Disinfestation Ltd., and the marine work is being transferred to the Marine Division of Disinfestation Ltd. Agricultural and Industrial Coatings Ltd., who specialise in timber decay treatment, will continue to operate under their own name.

The British Ratin Group, which is the largest pest control organisation in the country, now consists of the British Ratin Co. Ltd., Disinfestation Ltd. (incorporating Insecta Laboratories Ltd. and the Scientex Companies), Rentokil Ltd., Woodworm & Dry Rot Control Ltd., Fumigation Services Ltd. (including the Furniture Preservation Service), Mi-Dox Ltd., Termite Control Ltd., and Agricultural and Industrial Coatings Ltd.

## New Woodworm and Dry Rot Centre and Pest Advisory Centre

London's new Woodworm and Dry Rot Centre, at 16 Dover Street, London, W.1, was officially opened by the Right Worshipful the Mayor of Westminster, Group Captain G.H. Pirie, C.B.E., J.P., at a lunchtime reception on Thursday, 5th November.

In his opening speech the Mayor said that "After the war our City of Westminster probably suffered from the ravages of dry rot more than any other part of this fair land" and added "The combined Woodworm and Dry Rot and Pest Advisory Centre will be of tremendous value to the countless people who visit London."

The first Woodworm and Dry Rot Centre was opened in Bedford Square London, some 9 years ago and it soon





Some of the exhibits to be seen at the new Pest Advisory Centre. In the picture are S. R. Gauntlett, Director of the Centre, and Miss Jillian Rice, Technical Adviser.

became established as the place from which members of the public—or their professional advisers, such as architects, surveyors and estate agents—could obtain information and expert advice free of charge.

Following the success of the London Centre several Provincial Centres were opened. Whilst the number of Centres were increasing the activities of the research Laboratories, Felcourt, East Grinstead, were also increasing and the Centres were able to extend their information to pests other than wood boring insects. Now the life cycles of various insects such as cockroaches, food pests, and houseflies may be seen in attractive show cases. So, too, may be seen examples of damage caused by rodents. The free identification services now cover the scores of ants, beetles, spiders, moths and other troublesome and destructive insects which may be found in this country.

With the expansion in the range of services the Centre in Bedford Square became limited in both facilities and location. It was for this reason that it was decided to open the new Centre at 16 Dover Street, London, W.1. Here, in larger premises, with a newly-designed exhibition, lecture room and cinema facilities on a separate floor, and a much more convenient and prominent position in the West End, the free advisory services will be extended on a more ambitious scale. Visitors to the Centre will also benefit from the activities of the Film Unit to which

a Field Research Unit has been attached.

The excellent exhibits at Dover Street have been designed by Mr. Claude Atkinson, who for many years was responsible for Ministry of Agriculture exhibitions.

The Director of the Centre is Mr. S. R. Gauntlett who has been closely associated with pest control for some 28 years. Lecturers will include Dr. Norman E. Hickin, Expert on Timber Decay, and Mr. Miles Price, a research scientist who has been responsible for new developments in the fields of rodent and insect control.

#### Residue Scares—Safety of Amino-triazole Stressed

Following reports of aminotriazole residues in Cranberries, L. S. Hitchner, Executive Secretary, National Agricultural Chemicals Association (America) emphasised the necessity to follow the makers instructions, when using pesticides, in the following statement.

“Action by the Food and Drug Administration in stopping the sale of certain cranberry products because of their possible contamination through misuse of a weed-killing compound emphasises, once again, the importance of following directions on the label of a pesticide.

“In commenting upon the action of the Food and Drug Administration, Secretary of Health, Education, and Welfare Arthur S. Flemming stated that the weed-killer, aminotriazole, had been misused by the

growers in the North-west since label directions clearly indicated the product was to be used only *after* harvest. When the product is used as directed no residue will occur.

“It was on this basis that the product was registered by the U.S. Department of Agriculture under the provisions of the Federal Insecticide, Fungicide, and Rodenticide Act and in accordance with the Miller Amendment to the Food, Drug, and Cosmetic Act.

“The Pesticide Industry, the National Agricultural Chemicals Association, the National Safety Council, and a number of Government agencies have repeatedly stressed a programme of **Read and Follow the Label** when using pesticide chemicals.

“More education along these lines is needed. Had the principles of this programme been followed it would not have been necessary for the Food and Drug Administration to take such drastic action in this matter.

“According to competent toxicologists who have extensively studied the chemical in question, the extremely small amounts present on cranberries could not offer any significant risk to the consumer. They point out that tumors were found in rats only after a lifetime of feeding on a diet containing approximately 100 times as much of the chemical as has been found on the contaminated lots of cranberries, and that cranberries constitute only a small fraction of the total human diet. They further point out that humans would have to subsist almost entirely on a diet of these cranberries for years in order to approximate the conditions which cause tumors in the test animals.

“The Food and Drug Administration has not established a tolerance for residues of aminotriazole on cranberries or other food crops. However, if the product is used according to label directions it will not result in any residues on the harvested crop and therefore presents no hazard to the public health. This was pointed out by Secretary Flemming and George P. Larrick, Commissioner of Food and Drugs, at a press conference held in Washington on 9th November. In fact, these officials cited aminotriazole for its effectiveness as a weed-killer when used according to directions.”

These facts should be borne in mind wherever pesticides are used.



### Radio Frequency Used to Kill Weevils

It is reported in the "Atoms for Peace Digest" of 27th October that Scientists of the U.S. Department of Agriculture have used heat from radio-frequency electrical fields to kill in a few seconds rice and granary weevils, flour beetles and lesser grain borers in stored wheat. These insects cause untold loss and damage every year throughout the world.

The radio frequencies used to produce temperatures of 60 to 66°C.—hot enough to kill the insects while not damaging the rice or wheat. The Department of Agriculture is now working to make the radio-frequency method commercially practical.

### Foot-and-Mouth Disease — Warning to Farmers in Channel Coastal Areas

Owners of livestock, particularly in coastal areas in the south of England, are warned to keep an extra careful watch for suspicious symptoms in their animals and to report at once to the police if they suspect foot-and-mouth disease.

Outbreaks of foot-and-mouth disease in parts of France bordering the English Channel showed a sudden rise in August. A further sharp increase occurred in September, and there is a risk of infection being introduced from the Continent by the migration of birds at this time of the year. Prompt action is essential to prevent widespread disease.

### Fowl Pest — Extension of Poultry Movement Restrictions in East Anglia

On 21st November, the Infected Area restrictions already in operation in East Norfolk, Cambridge, Huntingdon and the Isle of Ely were extended to include West Norfolk and the whole of Suffolk. This further extension of the Infected Area restrictions was made necessary by the spread of infection into Suffolk where eight outbreaks were reported. The disease has also spread into West Norfolk.

Some five hundred and fifty outbreaks of fowl pest have occurred in thirty-nine counties since 1st October.

Poultry keepers should continue to keep a close watch on the health of their flocks and report any suspicious symptoms to the police immediately. It is also very important, especially for owners employing intensive methods of production, to ensure that strangers only go among their flocks when the visit is unavoidable.

Pest Technology hopes that everyone obtains their Christmas dinner at a reasonable price. It should be possible despite the recent outbreaks.

### M.A.F.F. and Poultry Industry Discuss Fowl Pest

At a meeting on 20th November, 1959, Officials of the Ministry of Agriculture, Fisheries and Food met representatives of the poultry industry and veterinary profession.

Organisations represented were: National Farmers' Union; Animal Health Trust; Accredited Poultry Breeders' Federation; Poultry Association of Great Britain; Chick Producers' Association; Poultry Club; Egg Marketing Board; National Association of Poultry Packers Ltd.; British Broiler Grow-

ers' Association and the British Turkey Federation.

The efforts being made to control the fowl pest epidemic were described and certain suggestions made by the poultry industry to assist to that end. The meeting emphasised the absolute need for the continued prohibition by law of the import of hatching eggs from countries where fowl pest and other poultry diseases exist. Any break of the regulations must inevitably put the whole industry in this country at risk as regards the control of poultry diseases. The representatives noted the extremely serious situation that exists and have agreed to consult their organisations and bring to the attention of poultry-keepers the ways in which they can most effectively help to reduce the risk of further spread of infection.

## BOOK REVIEWS

### British Chemicals and their Manufacturers—1959

*Published by The Association of British Chemical Manufacturers, Cecil Chambers, 86 Strand, London, W.C.2.*

This publication, which is the directory of the above Association is now available, *free of charge* to all firms genuinely interested in the manufacture or purchase of chemicals. All enquiries should be addressed to the Association at the above address.

This edition is an extension of previous publications in the series and contains over 12,000 products named systematically and in accordance with British Standard 2474, 1954—"Recommended Names for Chemicals Used in Industry."

This directory is unique within the chemical field in that only actual manufacturers of the products are named against each entry. We find the publication to be a valuable reference and feel sure that anyone interested in the manufacture and purchase of chemicals will find it a useful publication for their book-shelf.

### Record of the 1959 Annual Convention of the British Wood Preserving Association

*Issued by the British Wood Preserving Association, 6 Southampton Place, London, W.C.1.*

This publication forms a complete record of the papers, delivered to the Association's Annual Convention

and reported in abstract form in "Pest Technology" 1, 10/11, 12.

In addition there is a report of the ensuing discussion and Mr. C. E. Carey, Chemical Products Department, South Eastern Gas Board has briefly summarised the papers. To refresh our reader's memories the papers read at the conference were:—

- (1) The Influence of Soft Rot on the Susceptibility of Beech to Attack by the Common Furniture Beetle. By J. D. Bletchly, B.A., B.Sc., F.R.E.S.
- (2) The Fine Structure of Wood with Special Reference to Timber Impregnation. By R. D. Preston, F.R.S.
- (3) The American Wood-Preservers' Association and Some Recent Developments in the Wood Preserving Industry. By J. M. Gurd.
- (4) Boron as a Wood Preservative. By D. R. Carr, B.Sc.
- (5) Further Studies on the Composition of Wood Preserving Creosote. By D. McNeil, B.Sc., Ph.D., F.R.I.C.
- (6) Some Forest Pests. By E. H. B. Boulton, M.C., M.A., F.I.W.Sc.
- (7) An Interpretation of the Trends in the Production of Treated Wood and in the Use of Wood Preservatives in the United States; 1953-58. By Reginald H. Colley.

Readers who were interested in our abstracts from the Convention will find the Record worthwhile reading.